

(No Model.)

2 Sheets—Sheet 1.

A. S. WOODWARD.
APPARATUS FOR REDUCING ASBESTOS FIBER.

No. 553,091.

Patented Jan. 14, 1896.

FIG. 1.

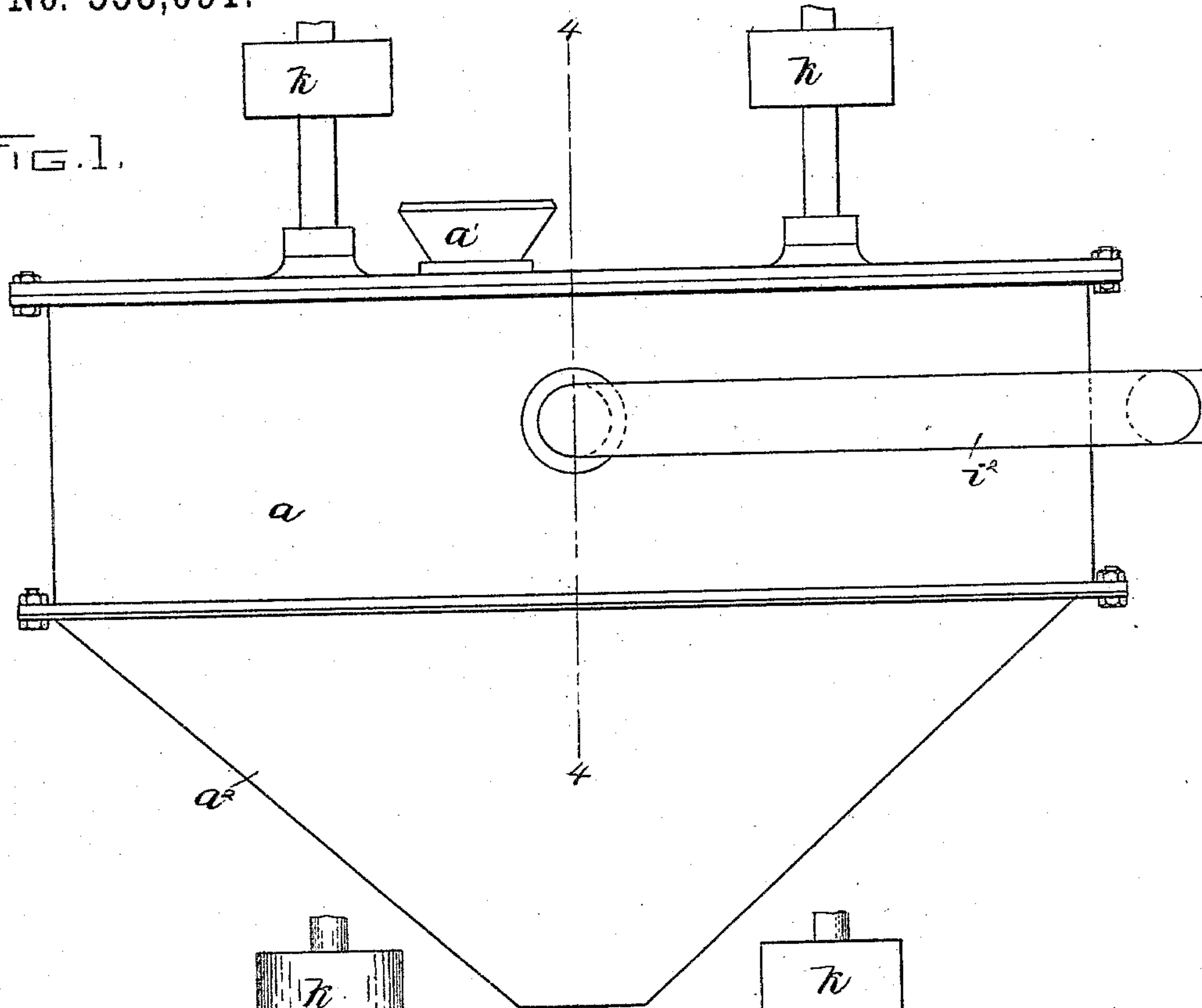
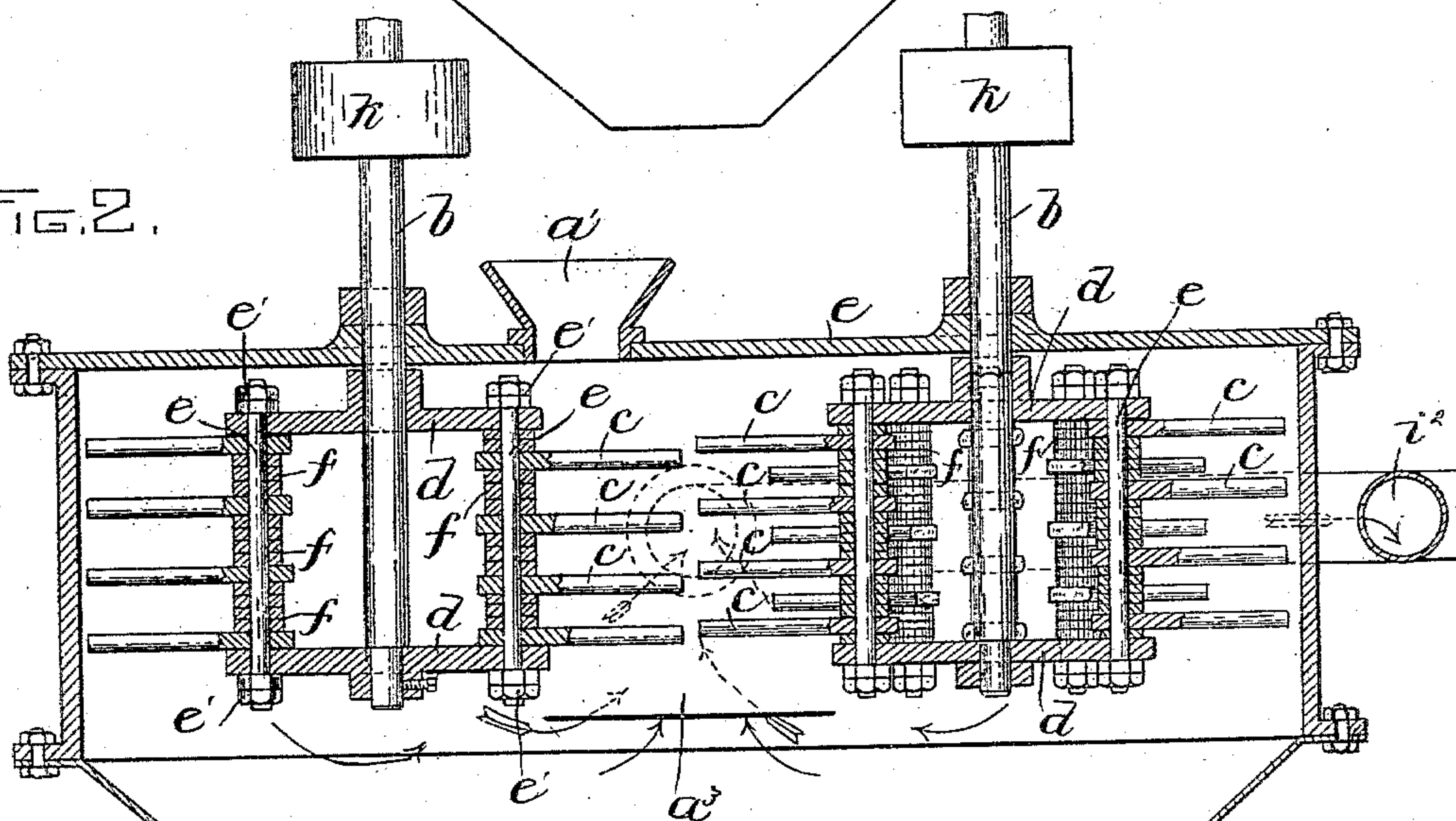


FIG. 2.



WITNESSES:
Lathams & Brown.
A. S. Harrison.

INVENTOR:
A. S. Woodward
by Knight Brown Crossley
Atty.

(No Model.)

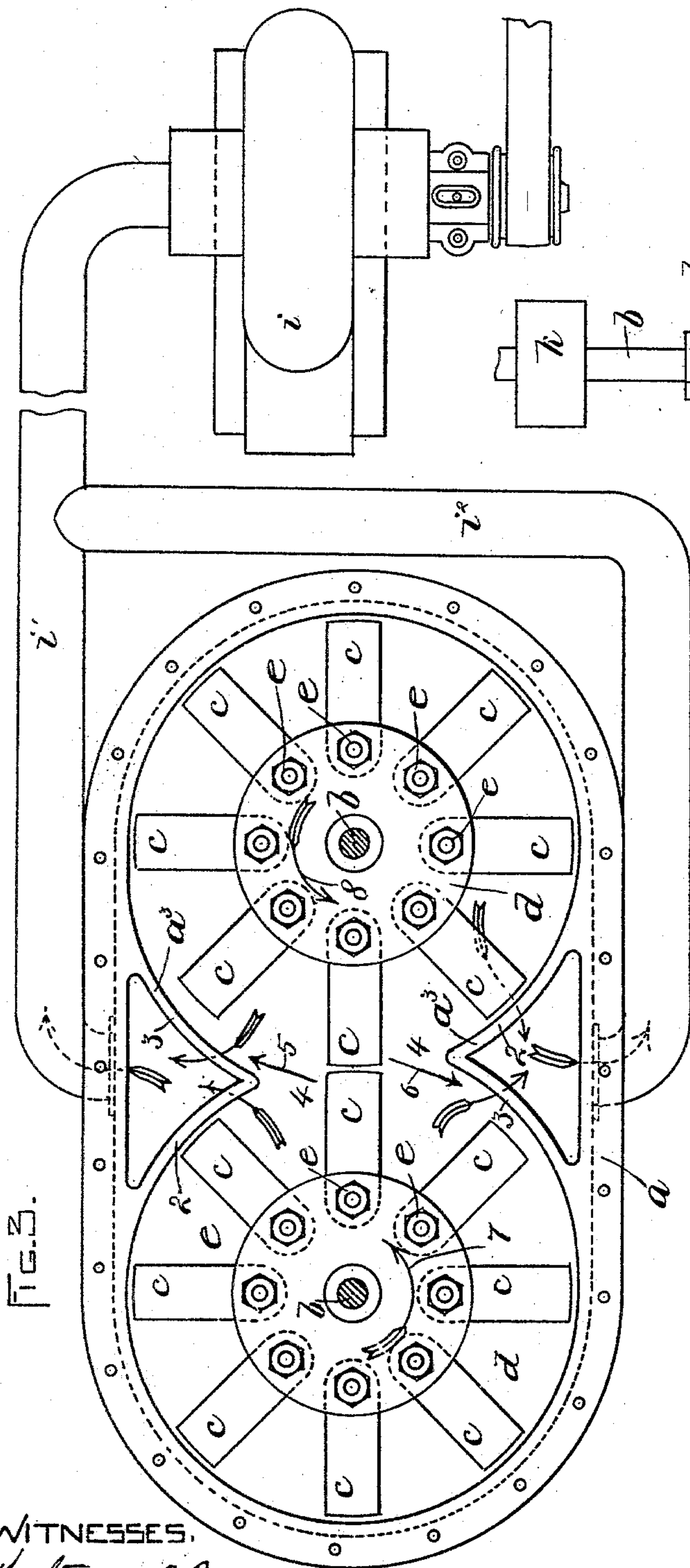
2 Sheets—Sheet 2.

A. S. WOODWARD.

APPARATUS FOR REDUCING ASBESTOS FIBER.

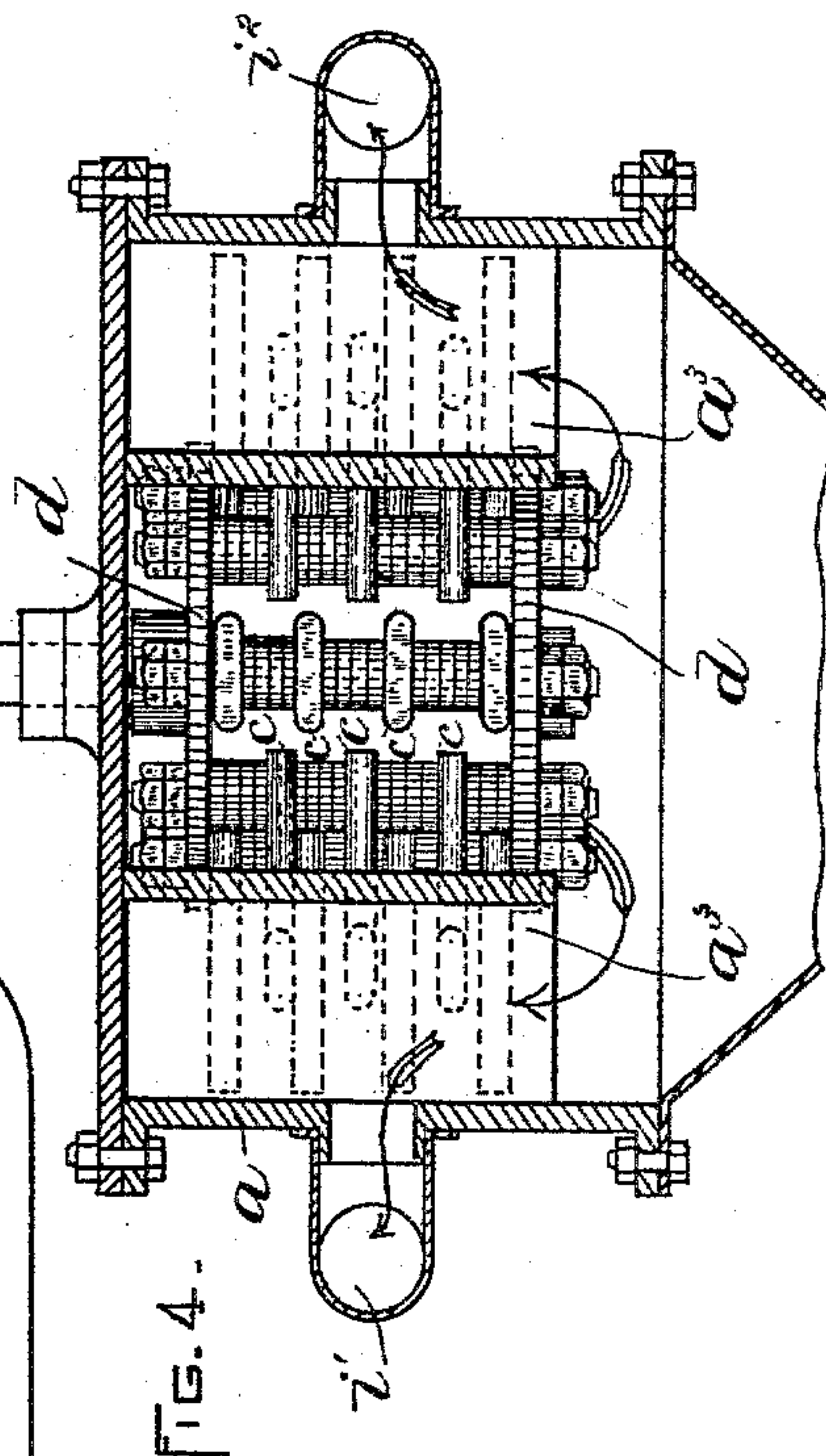
No. 553,091.

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WITNESSES.

Katherine E. Brown.
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INVENTOR:

A. S. Woodward
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UNITED STATES PATENT OFFICE.

ALONZO S. WOODWARD, OF PEPPERELL, MASSACHUSETTS, ASSIGNOR TO
HENRY A. PARKER, OF SAME PLACE.

APPARATUS FOR REDUCING ASBESTOS FIBER.

SPECIFICATION forming part of Letters Patent No. 553,091, dated January 14, 1896.

Application filed February 4, 1893. Serial No. 460,983. (No model.)

To all whom it may concern:

Be it known that I, ALONZO S. WOODWARD, of East Pepperell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Reducing Asbestos Fiber, of which the following is a specification.

This invention has for its object to provide improvements whereby masses of asbestos may be converted into fiber without pulverizing the fiber and breaking it into undesirably short pieces.

Heretofore it has been customary, in converting masses of asbestos into fiber, to subject the masses to the action of crushing rollers, the result being that a very large percentage of the whole material is reduced practically to powder, the percentage of fiber of desirable length for the production of asbestos cloth and other articles requiring a fiber of considerable length being very small.

My invention consists in an apparatus embodying a casing or receptacle for the masses of asbestos to be treated, revolving beaters within said casing yieldingly supported and arranged so that each will strike a yielding blow upon the masses of asbestos introduced into the casing, an exhaust-fan connected with a flue or trunk leading from the casing, the arrangement being such that the yielding beaters detach the fibers from the masses of asbestos, while the fan removes the fibers as fast as they are detached, so that the entire mass of asbestos, or the greater part thereof, is converted into fibers of desirable length, and means for preventing the entrance of the unreduced material thrown about by the beaters from entering the outlet-flue.

The invention also consists in certain minor improvements, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of a portion of my improved apparatus. Fig. 2 represents a longitudinal section of the same. Fig. 3 represents a top view of my improved apparatus, the cover of the casing which contains the revolving beat-

ers being removed to show the interior of the casing and the beaters. Fig. 4 represents a section on line 4 4, Fig. 1.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents a casing or receptacle which is provided in its top with the hopper *a'* for the reception of the pieces of asbestos to be treated, and is preferably provided with a tapering bottom portion *a''*, which receives the unreduced pieces of asbestos that pass through the beaters.

b b represent two vertical shafts which are provided within the casing *a* with pivoted yielding arms or beaters *c*, which are adapted to be revolved horizontally within the casing by the rotation of the said shafts.

The means for pivotally connecting the arms with the shafts may be variously modified without departing from the spirit of my invention. I prefer the means shown in Figs. 2 and 3, the same consisting of flanges or collars *d d* affixed rigidly to the shafts within the casing, and vertical pivoted rods *e* passing through said flanges and secured thereto by nuts *e'*, the beaters *c* being mounted to turn freely upon said pivoted rods and separated from each other by washers *f f* strung upon the pivoted rods between the beaters, each beater being preferably a piece of metal perforated at its inner end to receive one of the pivoted rods, and adapted to swing freely in a horizontal plane upon said rod. The beaters therefore are caused by centrifugal force to radiate from the shafts *b* when the shafts are rotated, each beater being adapted to strike a yielding blow on a piece of asbestos dropped into the casing. The washers *f* and the beaters are readily removable from the pivoted rods, so that the beaters may be readily adjusted vertically and placed at any desired distance apart, each rod *e* being adapted to hold a plurality of beaters, as shown in Fig. 2. I prefer to arrange the beaters on one shaft, so that they will alternate with those on the other shaft; also I prefer to arrange the beaters connected with each shaft in such manner that the beaters

on one rod will alternate with those on the next rod on the same shaft, as shown at the right in Fig. 2.

The casing a is provided with inwardly-projecting hollow abutments a^3 , the outer sides of which are curved and constitute continuations of the curved inner walls of the casing, said walls being curved to conform to the rods of the beaters, as shown in Fig. 3. Each of the abutments a^3 is open at its lower end, as shown in Fig. 4, and closed at its upper end. Each abutment is provided with a side 2 which is substantially concentric with one of the shafts b , and a side 3 which is eccentric to the other shaft b , as shown in Fig. 3. This arrangement locates the apex 4 of one abutment nearer the shaft at the left-hand end of the casing, and the apex 4 of the other abutment nearer the shaft at the right-hand end of the casing. The object of this arrangement is to enable the pieces of asbestos which are struck by the beaters to be transferred from one beater to the other, in the manner indicated by the arrows 5 6 in Fig. 3. A piece of asbestos thrown off tangentially by the beaters on the left-hand shaft at the arrow 5 will strike the eccentric side 3 of one of the abutments and will rebound into the field of the beaters on the other shaft. In like manner a piece of asbestos thrown off by the beaters on the right-hand shaft at the arrow 6 will strike the eccentric side 3 of the other abutment and in rebounding will be thrown into the field of the beaters on the left-hand shaft. The pieces of asbestos will therefore be subjected to more frequent blows and will be more rapidly reduced than would be the case if each piece remained in the field of the beaters of one shaft only.

i represents an exhaust-fan, which is connected by flues i' i^2 with the hollow abutments a^3 . When the fan is in operation it creates a draft through the said flues in the direction indicated by the arrows in Figs. 2, 3, and 4, so that the fibers formed by the action of the beaters are carried away through said flues as fast as they are separated from the masses or pieces of asbestos. It will be seen, therefore, that the fibers are removed from the action of the beaters as fast as they are detached, so that the original length of the fibers is preserved, their being no liability of the breaking up of the fibers by the repeated contact with the beaters which detach them from the masses of asbestos.

The unreduced pieces of asbestos that fall below the beaters enter the tapering bottom portion a^2 , and may be removed therefrom for subsequent treatment in any suitable way. I prefer to again pass the unreduced pieces that accumulate in the bottom portion a^2 through the casing, and to repeat the operation until the pieces are entirely reduced.

The shafts b are rotated in the direction indicated by the arrows 7 8 in Fig. 3. Power may be applied to said shafts by means of

belts running on pulleys k k on said shafts or in any other suitable way.

It will be seen that the abutments a^3 constitute hoods which prevent the unreduced material thrown about by the action of the beaters from entering the flues or passages i' i^2 , said hoods extending below the beaters, and being open only at their lower ends or at points below the beaters, as shown in Fig. 4, so that all pieces that are too heavy to be carried by the air-currents will fall to the bottom of the casing, while the fibers will pass, without reduction of their original length, into and through the hoods or abutments a^3 and out of the machine.

It is obvious that a single shaft, with a set of beaters thereon, and a single hood communicating with the casing below the beaters, and communicating also with the air-exhausting apparatus, would embody the essential features of my invention. Hence I do not limit myself to the employment of a plurality of shafts or to the employment of a plurality of abutments or hoods a^3 .

The form of the casing and the form and arrangement of the beaters may be variously modified without departing from the spirit of my invention.

I claim—

1. An organized apparatus for reducing asbestos to a fibrous condition, the same comprising a receptacle having a receiving opening or inlet at its top and an outlet at its bottom, said inlet, receptacle, and outlet constituting a vertical conduit through which masses of asbestos may pass by gravitation, yielding beaters in the receptacle, means for revolving said beaters to cause them to yieldingly strike masses of asbestos passing through the casing, an outlet flue or passage extending laterally from said casing between the inlet and outlet, and air-exhausting apparatus communicating with said flue whereby the fibers detached by the yielding blows of the beaters are removed without reduction of their original length, and means for preventing the entrance of the unreduced material into the outlet flue.

2. In an organized apparatus for reducing asbestos to a fibrous condition, the combination of a casing, yielding beaters therein, a hood or hollow abutment in the casing communicating with the interior of the casing at a point below the beaters, an outlet flue or passage communicating with the interior of said hood, and an air-exhausting apparatus communicating with the hood, as set forth.

3. In an organized apparatus for reducing asbestos to a fibrous condition, the combination of a casing; two shafts therein, each provided with pivoted yielding beaters within the casing; hollow hoods or abutments at the sides of the casing, projecting partly between the beaters of one shaft and those of the other, said hoods having eccentric sides arranged as shown, whereby the pieces of as-

bestos thrown by one set of beaters are caused
to enter the field of the other set of beaters;
outlet passages communicating with the said
hoods or abutments; and an air-exhausting
5 apparatus communicating with said passages;
as set forth.

In testimony whereof I have signed my

name to this specification, in the presence of
two subscribing witnesses, this 26th day of
January, A. D. 1893.

ALONZO S. WOODWARD.

Witnesses:

GEORGE G. TARBELL,

W. D. RYDER.